06 M 108 E

Cembre

Certified Quality Management System

ENGLISH

BATTERY OPERATED

RAIL DRILL TYPE LD-12B

PATENTED

CE

OPERATION AND MAINTENANCE MANUAL

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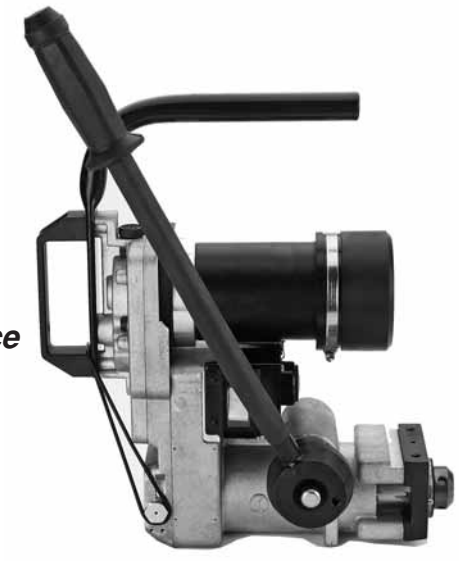
Ref. LD-12BN:

basic drill without clamping device



Ref. LD-12B:

(LD-12BN + DBG-F)

basic drill complete with railweb clamping device type DBG-F

15. RETURN TO Cembre FOR OVERHAUL

In the case of a breakdown, contact our Area Agent who will advise you on the problem and give you the necessary instructions on how to dispatch the machine to our nearest service Centre; if possible, attach a copy of the Test Cerificate supplied by **Cembre** together with the machine or, if no other references are available, indicate the approximate purchase date and the machine serial number.

Acoustic Noise (Directive 2006/42/EC, annexe 1, point 1.7.4.2 letter u).
– The weighted continuous acoustic pressure level equivalent A at the work place LpA is equal to ..... 82,3 dB (A)
– The maximum value of the weighted acoustic displacement pressure C at the work place LpCPeak is ..... < 130 dB (C)
– The acoustic power level emitted by the machine LWA is equal to ..... 89,3 dB (A)

Risks due to vibration (Directive 2006/42/EC, annexe 1, point 2.2.1.1).
Tests carried out in compliance with the indications contained in UNI ENV 25349 and UNI EN 28662 part 1st Standards, and under operating conditions much more severe than those normally found, certify that **the weighted root mean square in frequency of the acceleration the upper limbs are exposed to for each biodynamic reference axis does not exceed 2.5 m/sec2.**

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Code No	Item	Description	Qty
6001762	39	Complete bush	1
6001768	38	Spring support spacer	1
6001769	37	Spring	2
6180201	36	M 5 self-locking nut	2
6001776	35	Pin	2
6001766	34	Spring support	2
6760378	33	ø 8x50 cylindrical pin	2
6340612	32	M5ball dowel	2
6900314	31	M 6x18 screw	4
6900348	30	M 8x25 screw	2
6650144	29	ø 8 elastic washer	4
6760222	28	ø 4x10 cylindrical pin	1
6140082	27	ø 1,8x35 split pin	1
6001138	26	TDB1 end piece	1
6140082	25	ø 1,8x35 split pin	1
6001775	24	TDB6 end piece	1
6140080	23	Split pin	1
6001137	22	TDB3 end piece	1
6040421	21	ø 10 circlip	1
6001156	20	Pin	1
6001761	19	Left support shoulder	1
6001759	18	Right support shoulder	1
6001757	17	Blocking side plate	2
6001764	16	Plate	1
6001772	15	Pin	2
6340160	14	M 8x10 grub screw	1
6380310	13	Hand grip	2
6001150	12	Hand wheel	1
6001151	11	Blocking screw	1
6001659	10	Spacer	1
6490052	09	Handle	1
6001152	08	Bush	1
6180300	07	M 8 nut	1
6520422	06	Cup spring	1
6140085	05	ø 2,5x15 split pin	1
6001172	04	Extension	1
6340205	03	M 8 x 35 grub screw	1
6001145	02	Blocking support	1
6001281	01	Reference rod	1

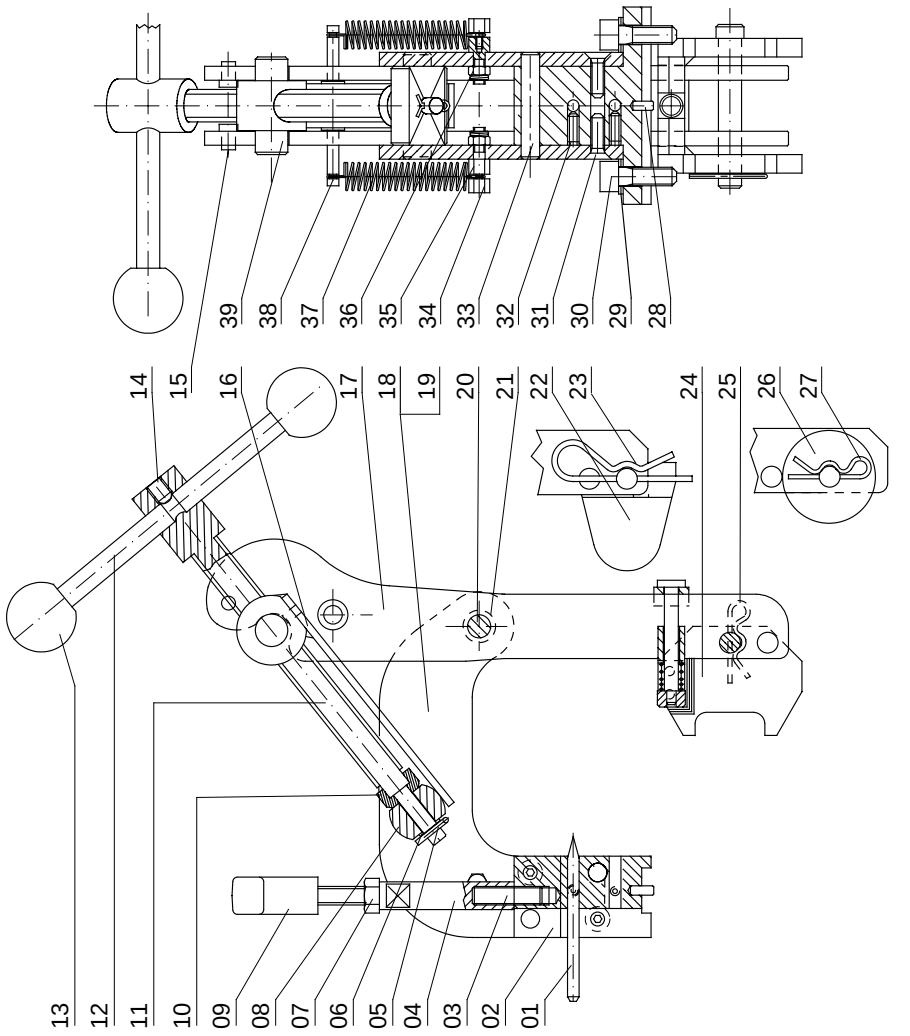


FIG. 32 – "DBG-F" RAIL WEB CLAMPING DEVICE

WARNING

⚠ ***Before using the drill, carefully read the instructions contained in this manual.***

⚠ ***During drilling keep your hands outside the danger area.***

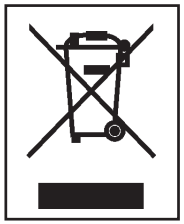
⚠ ***Always wear protective glasses and working gloves.***

⚠ ***Avoid wearing clothes which may present a risk to personal safety.***

⚠ ***Always disconnect battery pack when not in use, when changing the cutters and before servicing.***

⚠ ***Do not discard batteries into garbage can or waste disposal.***
Always recycle the batteries.
Do not short circuit the batteries.

Following information applies in member states of the European Union:



USER INFORMATION in accordance with "**Directives 2002/95/EC and 2002/96/EC regarding the reduction of hazardous substances in electrical and electronic equipment, including the disposal of waste**".

The 'Not in the bin' symbol above when shown on equipment or packaging means that the equipment must, at the end of its life, be disposed of separately from other waste.
The separate waste collection of such equipment is organised and managed by the manufacturer. Users wishing to dispose of such equipment must contact the manufacturer and follow the prescribed guidelines for its separate collection.
Appropriate waste separation, collection, environmentally compatible treatment and disposal is intended to reduce harmful environmental effects and promote the reuse and recycling of materials contained in the equipment.
Unlawful disposal of such equipment will be subject to the application of administrative sanctions provided by current legislation.

RAIL DRILL TYPE LD-12BN

1. GENERAL CHARACTERISTICS

– **Drilling capacity:** ..... ∅ 7 to 19 mm

– **Speed without load:** ..... 230 rpm

– **Electric motor:**
– *No fanning, 4 poles.*
– *Supply voltage:* ..... 24 V DC
– *Power rating:* ..... 345 W
– *Protection:* ..... IP 54
– *Insulation:* ..... F class
– *Duty cycle:* ..... intermittent S3
– *Automatic switch: equipped with thermal cut-out to protect the motor against overheating caused by a current overload.*
– **Weight:** ..... 13,4 kg
– **Weight:** *with DBG-F clamping device* ..... 17,3 kg
– **Oil bath gear reducer unit**
– **Recommended oil for gear reducer unit:** ..... **MOBIL DTE OIL LIGHT** *or*
ESSO TERESSO 32 *or equivalent*

– **For "Acoustic noise" and "Risks due to vibration"**, see page 38.

2. ACCESSORIES SUPPLIED WITH THE DRILL

2.1) Guide bits for controlling the coolant system:
for broach cutters suitable for drilling thicknesses up to 25 mm
– 1 pc **PP 1**, diameter 7 mm
– 1 pc **PP 2**, diameter 8 mm

for broach cutters suitable for drilling thicknesses up to 50 mm
– 1 pc **PPL 1**, diameter 7 mm
– 1 pc **PPL 2**, diameter 8 mm

2.2) Spacer, type **DPE**, for controlling the coolant system, for special spiral bits.

2.3) Adaptor, type **ARE**, for external cooling, to be used with the SR 5000 cooling unit.

2.4) Grub screw, M8x10
– 4 pcs for clamping cutters or bits onto the spindle shaft.

2.5) Socket head cap screws, M6x16
– 4 pcs for securing positioning templates to the front plate.

2.6) Socket head cap screws, M6x25
– 4 pcs for securing special positioning templates to the front plate.

When ordering spare parts always give the following information:
- spare part code
- spare part description
- drilling machine model
- drilling machine serial number

Guarantee conditions cease upon usage of non original spare parts.

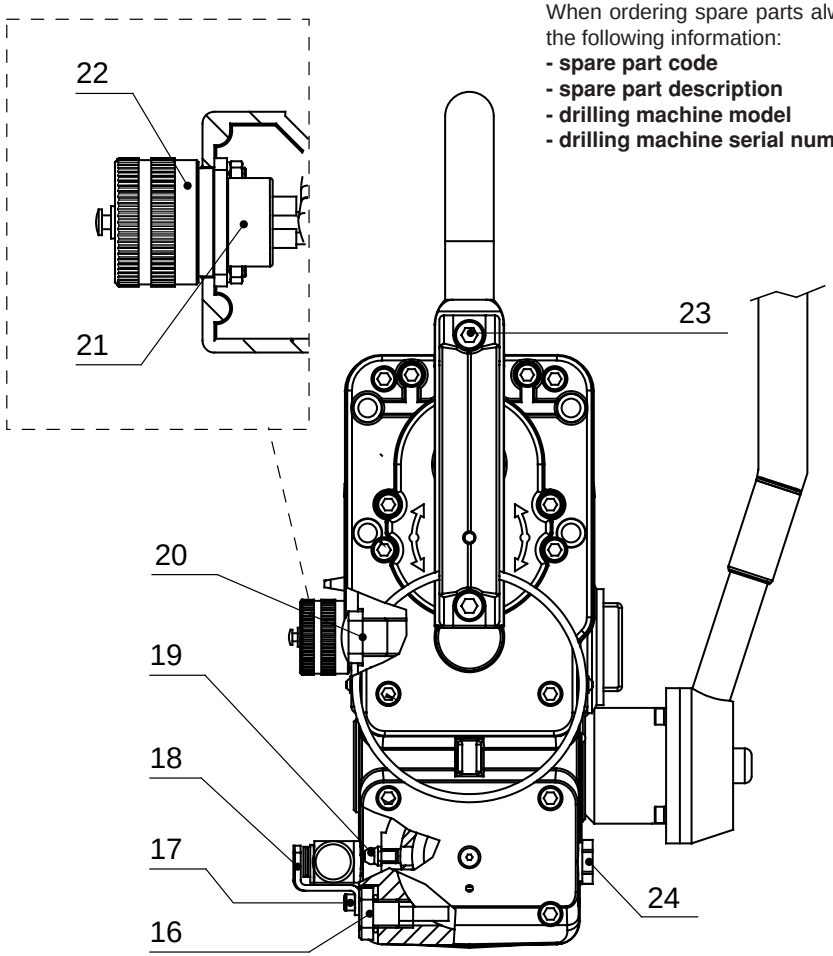
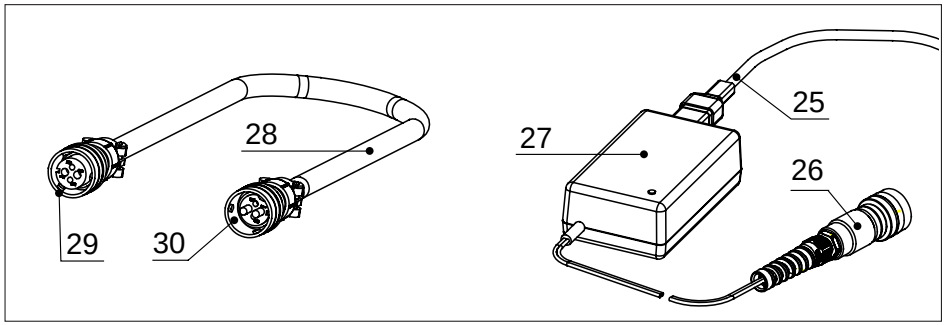
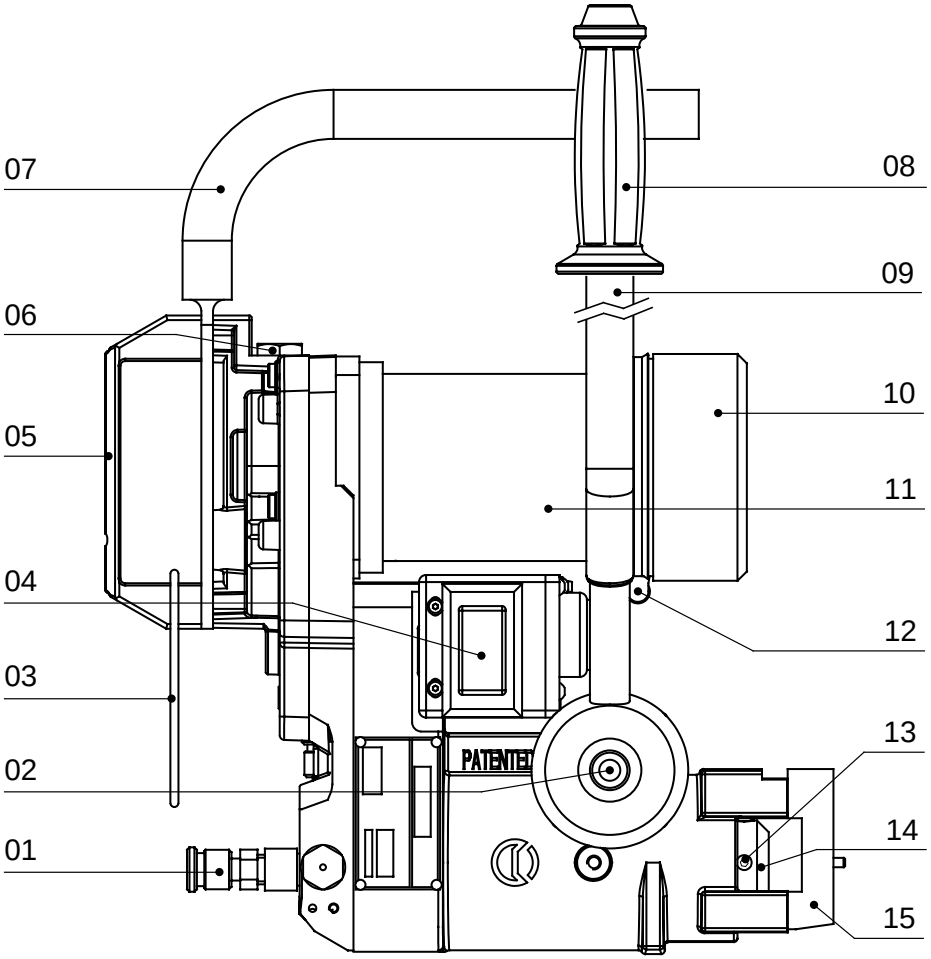


FIG. 31 – LD-12BN DRILL





Code No	Item	Description	Qty
6003162	30	Male connecting cable plug	1
6000687	29	Female connecting cable plug	1
6002808	28	Complete connecting cable	1
6002988	27	Complete charger	1
6003157	26	Charger plug	1
6002989	25	Supply cable	1
6001397	24	Complete air valve	2
6900346	23	M 8x20 screw	1
6000390	22	Protective plug cap	1
6002820	21	Complete plug	1
6001195	20	Transparent inspect.cover	1
6001198	19	Lubricator	1
6001731	18	Guard	2
6900060	17	M 4x8 screw	1
6001209	16	Magnetic cap	1

Code No	Item	Description	Qty
6001144	15	Front plate	1
6001146	14	Drilling spindle	1
6340160	13	M 8x10 grub screw	2
6002807	12	Metallic collar	1
6002796	11	24V DC electric motor	1
6002795	10	Motor cover	1
6002800	09	Complete spindle adv.lever	1
6380330	08	Hand grip	1
6380316	07	Handle	1
6001210	06	Oil cap	1
6001238	05	Carrying handle	1
6002815	04	Automatic switch	1
6360480	03	O-ring	1
6001176	02	Lever release pawl	1
6001428	01	Complete coolant connection	1

2.7) Range of tools:
– 1 pc 5 mm **Allen key**
– 1 pc 6 mm **Allen key**
– 1 pc 4 mm **Allen key**, with handle
– 1 pc **brush**

2.8) 140 ml oil bottle <u>for gear sump</u>

Parts 2.1 to 2.8 are included in the "LD-12BN ACCESSORIES KIT " code 6001357.

2.9) Type SR 5000 cooling unit.

2.10) Battery charger for charging the battery pack (see **§ 4**):
Input: 100 - 240 V AC / 50 - 60 Hz
3 Step charger
– *Orange led:* The battery is discharged and the charging current is maximum.
– *Yellow led:* The battery is normally between 80 and 95% charged and the charging current is lower than maximum.
– *Green led:* The battery is fully charged and the charger is in standby mode.

The charging time for the battery pack is approx. 2h +/-30 min.

2.11) Feed cord length 1,8 m (6 ft).
for connecting the battery pack
to the drill.

3. ACCESSORIES TO BE ORDERED SEPARATELY

3.1) Battery pack
Two different battery power packs are available to feed the drill:

– **type BP 24-10** (24 V - 10 Ah)
weight: 11 kg

– **type BP 24-16** (24 V - 16 Ah)
weight: 17 kg

3.2) DBG-F device (*) with moving arm for clamping the drill to the rail web and fittings, complete with the following end pieces:
– **TDB 6:** standard end piece for rails and stock rails.
– **TDB 1:** for switch blades and compound frogs.
– **TDB 3:** for repairing (adjusting) existing holes on rails for subsequent application of electrical connections and for additional special applications.

(*) Always supplied with drilling machine ref. LD-12B

3.2.1) DBG-LF device with moving arm complete with **TDB 1** end piece for clamping the drill to girder rails and for additional special applications.

14. WARNINGS

14.1) Regularly check for correct tightening (torque) of the fixing screws of the drilling tools and positioning shoes.
14.2) Avoid pressure jolts on the advancing lever during drilling.
14.3) Always make sure that the drilling swarf is properly removed before starting to drill a new hole.
14.4) Incomplete clamping of the drill on the rail to be drilled may lead to the breakage or accelerated wear of the drilling tool and damage to the spindle shaft bearings.
14.5) If it is necessary to operate the drill without the cutter inserted, remove the locking grub screws from the spindle shaft.
14.6) Avoid leaving the **SR 5000** tank under pressure and exposed to sunlight for long periods of time.
14.7) Should the clamping device be removed, make sure that by reassembling it, the two locking screws are firmly fastened.
14.8) After use, always put protection cap (22) back onto connecting plug (21) of the drill.

APPENDIX "A"

Factors which influence the number of holes that can be made according to the tool used:
– **Hardness of the material to be drilled.**
– **Thickness to be drilled.**
– **Stability of the drill clamping** and correct assembly of the drilling tool.
– **Suitable lubrocooling (lubrication/cooling)** to keep the temperature of the tool low so as not to compromise the efficiency of the cutting edges, whilst at the same time facilitating the removal of the swarf.
– **Contact time of the cutting edges of the tool with the material to be drilled;** bear in mind that the faster the hole is made the greater the efficiency.

– **Observance of these basic rules:**
1) **Commence drilling by exerting light pressure on the advancing lever, progressively increasing and then relaxing it when the tool is in the exit phase.**
2) Avoid pressure surges and advance according to the diameter of the drilling diameter, to avoid scratching the material or damaging the cutting edges of the tool.
3) Remember that a tool with efficient cutting edges requires a lower pressure than one with which a certain number of holes have already been made.
4) **When holes are made close to raised lettering on the rails, commence drilling with very light pressure** until the lettering disappears, to avoid possible breakage of the tool.
5) Bear in mind that when operating on very hard rails, as in the case of quality 1100 steel, it is advisable to increase the lubrocoolant flow rate.

Every 50 hours of operation

13.1.3) Checking the bolts

Check and retighten all bolts.

13.1.4) Lubrication

Lubricate the spindle support housing by means of the appropriate lubricator (19) and the screw of the clamping device with moving arm.

13.1.5) Cleaning the coolant filter (Refer to Fig. 30)

The coolant system of the drilling machine is provided with anti-impurity filter; should an evident decrease of the flow of the lubrocoolant occur, it could be necessary to clean the filter in the following way:

– Using a 14mm key, unscrew the coupling (01).
– Extract the filter and clean it carefully.
– Reassemble the filter into the coupling (01) as shown in the Fig. 30, fully tighten the coupling.

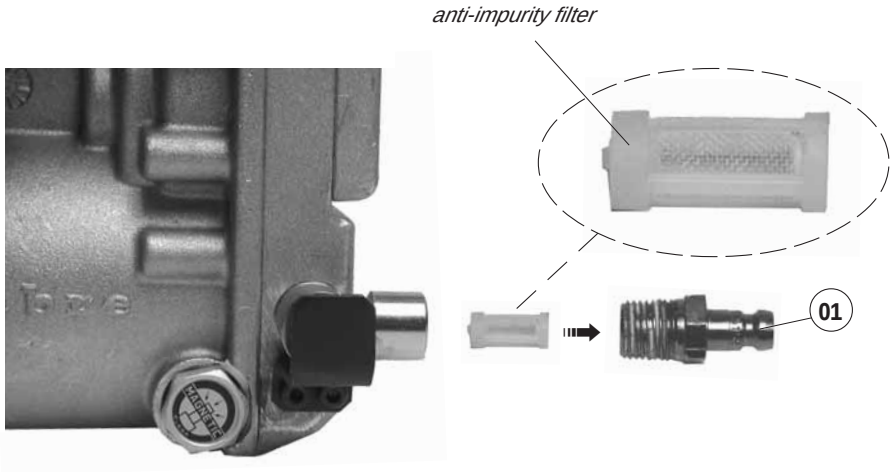


FIG. 30 – CLEANING OF THE COOLANT FILTER

3.3) DBS device for clamping the drill to flange rails, for use in conjunction with MPAF templates. **Using this device the rail drill can remain clamped in the drilling position even when trains pass over it.**

3.4) "VAL LD" metal case for storing the drill complete with DBG-F device, the DBS device and VAL MPA tool case.

3.4.1) "VAL LD-L" metal case for storing the drill complete with DBG-LF device, the DBS device and VAL MPA tool case.

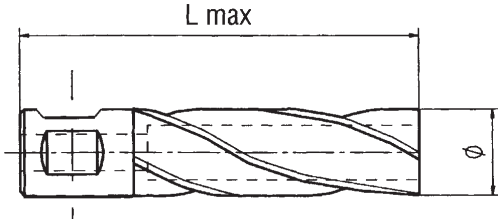
3.5) Templates for positioning the drill on rails and stock rails to enable drilling to be carried out according to the **provisions of railway boards standards:**
e.g.:
– **MPAF UIC54** on DRILLING AXIS of UIC 54 rail
– **MPAF UIC60** on DRILLING AXIS of UIC 60 rail
– **MPAFN UIC60** on DRILLING/NEUTRAL AXIS of UIC 60 rail

- ***Note:*** Contact **Cembre** for selection of specific application accessories.

3.6) MPAU universal positioning template suitable both for **repairing existing holes** on various fittings and for **drilling disused rails**.

3.7) VAL MPA tool case suitable for storing the accessories indicated in 3.5 - 3.6, and the drilling tools.

3.8) Broach cutters



BROACH CUTTERS FOR RAILS IN STEEL QUALITY 700-900-1100 (UIC 860.0)

Ø mm	SHORT RANGE		LONG RANGE (L max = 88mm)	
	Broach cutter	Guide bit	Broach cutter	Guide bit
13,5	**A 135**	Ref. **PP 1**		
14	**A 140**			
15	**A 150**			
16	**A 160**		**A 160L**	Ref. **PPL 1**
17	**A 170**		**A 170L**	
18	**A 180**	Ref. **PP 2**	**A 180L**	
19	**A 190**		**A 190L**	Ref. **PPL 2**
	MAX DRILLING THICKNESS **25 mm**		MAX DRILLING THICKNESS **50 mm**	

Broach cutters resharpening must be carried out in compliance with appropriate modes of operation which allow the best result. Contact **Cembre** for assistance and for other specific broach cutters.

Note: Contact **Cembre** for other specific broach cutters.

13. MAINTENANCE

⚠ **Before servicing or maintenance, stop the motor and disconnect the plug from the battery pack.**

After first 10 operating hours, proceed with sump oil change, as follows:
(Ref. to Fig. 31)
– *Remove the cap with the magnetic insert (24).*
– *Remove the oil filler cap (06).*
– *Make sure that all the oil comes out by slightly tilting the drilling machine in order to make the operation easier.*
– *Clean the cap (28) (see **§ 13.1.2**).*
– *Reassemble the cap.*
– *Fill the oil sump to the level indicator (see **§ 13.1.1**) using the oil supplied with the drilling machine; it will be necessary to use about **140 ml** oil.*
– *Replace the oil filler cap (06).*

13.1) <u>ORDINARY MAINTENANCE OF THE DRILL</u> (Refer to Figs. 29 and 31)

Every 20 hours of operation

13.1.1) Topping up oil
With the drill switched off and placed on a flat surface, check the oil level in the crankcase by looking through the appropriate transparent inspection cover (20).
The level must be approximately half way up the cover; if the level is low, top up the oil by unscrewing the cover (06) at the top of the crankcase and adding the quantity of oil required.

Only use the oil grade recommended in § 1.
Never use regenerated or used oil.
The oil must be clean.

13.1.2) Removing metallic residue from the crankcase

When the drill is positioned as shown in Fig. 29 unscrew the appropriate cap with magnetic insert (24) on which any metallic residue will have collected. Carefully clean the magnetic insert with a clean rag and screw it back in the appropriate housing.

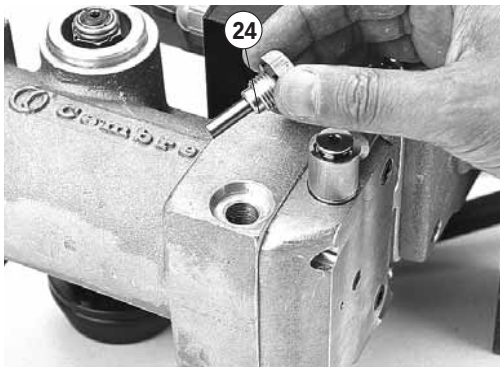


FIG. 29 –
REMOVING METALLIC RESIDUE

12. STORING THE DRILL

When the work has been completed, storage the drill by proceeding as follows:

12.1) Depressurise the tank of the **SR 5000** cooling unit (see **§ 5**), close the tap (02) on the hose from the tank, and disconnect the quick-coupling (03).

12.2) Carefully clean the drill, particularly in the spindle area, removing machining waste (swarf, etc.) and any deposits of lubricating coolant.

12.3) Fully withdraw the spindle.

12.4) Place the drill and the **SR 5000** cooling unit in a sealed place free from dust, moisture and the risk of accidental impact.

For better protection **Cembre** recommends the use of the **VAL LD** metal case designed for this purpose, which enables the drill to be located and locked in the case by means of the clamping device.

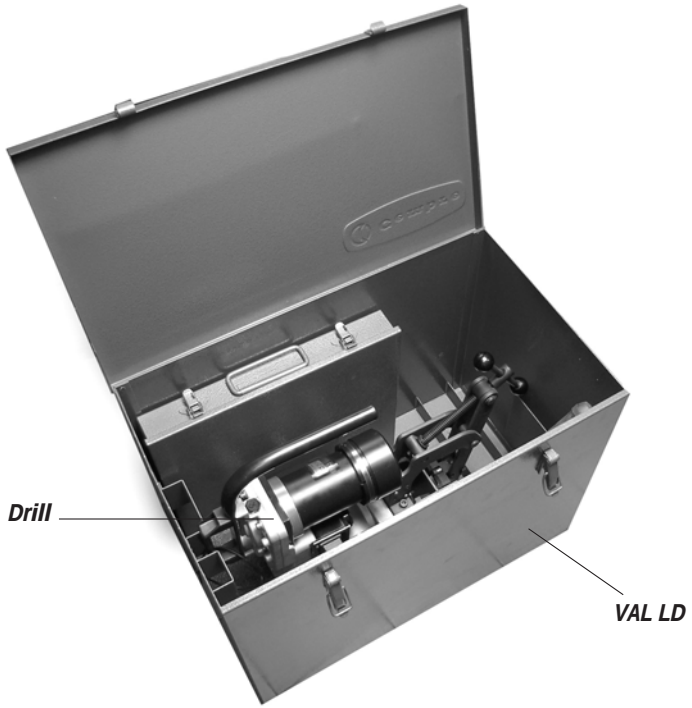


FIG. 28
STORAGE CASE

3.9) Spiral bits

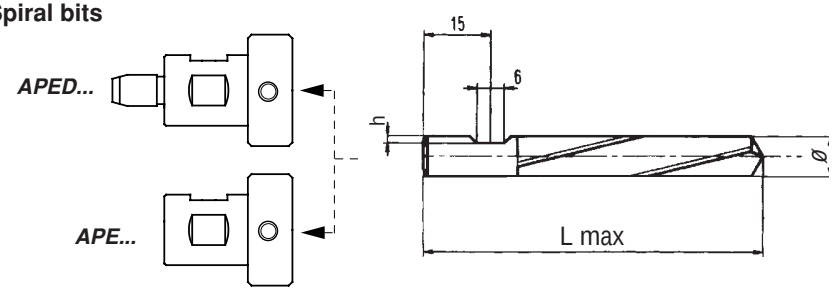


FIG. 1

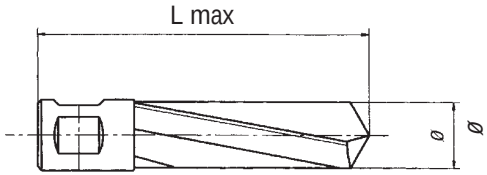


FIG. 1a

SPECIAL SPIRAL BITS FOR RAILS IN STEEL QUALITY 700 - 900 - 1100 (UIC 860.0)

Figure	Ø mm	Spiral Bit type (*)	L max mm	h mm	Adaptor type
1	7	PE 70	76	1,2	APED 70
	7,1	PE 71			
	8	PE 80		1,6	APE 80
	8,5	PE 85			
	9	PE 90			APE 90
	9,5	PE 95			APE 95
	10	PE 100			APE 100
	11	PE 110			APE 110
	12	PE 120			APE 120
	13	PE 130AR			APED 130
	13,5	PE 135AR			APED 135/165

Figure	Ø mm	Spiral Bit type (*)	L max mm	h mm	Adaptor type
1	14	PE 140	76	1,6	APED 135/165
	16	PE 160			
1a	17	PE 170AR	88		
	17,5	PE 175			
	18	PE 180			
	19	PE 190AR	85		

(*) PE... AR: special high quality spiral bit.

– *The special spiral bits in the **PE** range allow automatic cooling by means of the **SR 5000** unit supplied with the drilling machine.*
– *All spiral bits in the **PE** range allow drilling of **thicknesses up to 45 mm.***

The drilling tools indicated in the tables guarantee optimum results. For tools of other types, check the dimensional compatibility (particularly the size of the attachment and the length).

3.10) LR 2 BIODEGRADABLE LUBROCOOLANT

3 litre container to be used in a 5-10 % solution, for optimum operation of both broach cutters and **spiral bits.**

3.11) LR 3 ANTIFREEZE CONCENTRATE

3 litre added to the lubrocoolant mixture in the right concentration will maintain the lubrocoolant mixture fluid in negative temperature conditions.

4. BATTERY PACKS

FIG. 2

The battery power packs (to be ordered separately, see **§ 3.1**) are supplied discharged and will have to be charged before use (see **§ 4.1**)
Main features of battery power packs are as follows (Fig. 2b):
– Two 12Volt lead batteries connected in series and protected within a robust metallic frame.
– Gel electrolyte type batteries with safety valve, completely maintenance free and sealed.
– Operating temperature: -20°C to 50 °C.
– Test push-button (90).
– Status battery indicator (92).
– Connecting plug (94) for charger or drill, complete with protection cap (91).
– Strong canvas carrying bag with lateral pocket to store cables and charger (Fig. 2a).

FIG. 2a

Before starting any work, we suggest to check batteries level by pressing test push-button (90); the indicator (92) will then show the following information :
Green band : full charge
Yellow band : battery close to discharge
Red band : battery exhausted

FIG. 2b

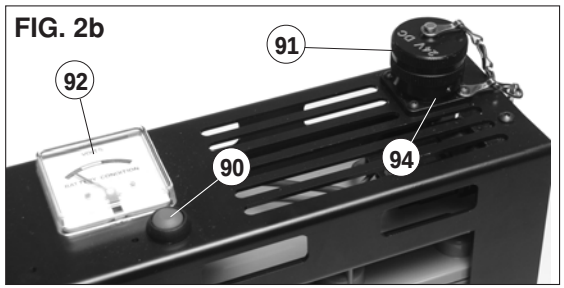
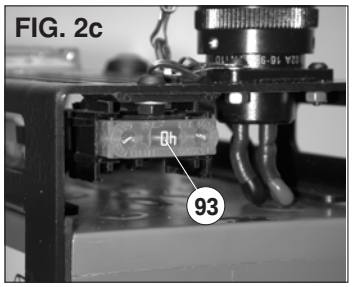


FIG. 2c



– Battery packs are protected against short-circuits or current overload by a **40A fuse** (93) (Fig. 2c); only same rated fuses shall be used in case of replacement.

11. DRILLING

⚠ **Before operating the drill, activate the coolant system (§ 5).**

11.1) **Drill fitted with broach cutter** (“short” type for drilling thicknesses of up to **25 mm** and “long” type for drilling thicknesses of up to **50 mm**).
Drilling may be started with the drilling machine fitted with cutter/bit, DBS clamping device and positioning template (§ 9.1), the drill being perfectly positioned on the rail flange (§ 9.2), as follows:
11.1.1) Connect the female quick-coupling of the **SR 5000** coolant unit to the male coupling (12) on the drill.
11.1.2) Open the tap (02) fitted on the coolant unit hose.
11.1.3) Connect the electric plug and press the automatic switch **(position " I ")** (Fig. 18)
.

⚠ **CAUTION: the automatic switch is equipped with protection against motor overheating; should the motor overheat the relay cut-out setting, the switch will move into the "0" position. At this stage, if the thermal conditions are correct, the switch will have to be re-set manually.**

11.1.4) **Proceed to drill by initially applying light pressure on the lever (36), increasing the pressure progressively, avoiding jolts, and finally relieving the pressure in the exit phase.**
When drilling close to raised markings on the rail, the initial pressure must be extremely light until the markings disappear, otherwise the cutter may be damaged.
11.1.5) The guide bit will enable the lubrocoolant to be discharged throughout the drilling process.
11.1.6) When the drilling has been completed, fully retract the spindle. With the lever in the initial position, as in Fig. 27, **stop the motor by pressing the automatic switch (position " 0 ")** , and make sure that the drilling swarf is removed before recommencing drilling.
11.1.7) After drilling it is advisable to remove all swarf from the tool and spindle area.

11.2) Drill fitted with special spiral bits
Follow the sequence described in § 11.1.
Bear in mind that the coolant circuit, instead of being automatically opened and closed by the guide bit, is kept open at all times by the **DPE** spacer fitted on the spigot of the spiral bit; it must therefore be activated, by opening the tap (02), before starting to drill, then switched off after drilling by closing the tap.

10.2.5) Relocate clevis (03) and tighten screw (04) with a 19 mm socket/spanner, to acheve firm clamping to the rail flange (see Fig. 26d).
N.B.: To be able to locate clevis (03) in working position, screw head (04) must lean against the body of the DBS device.

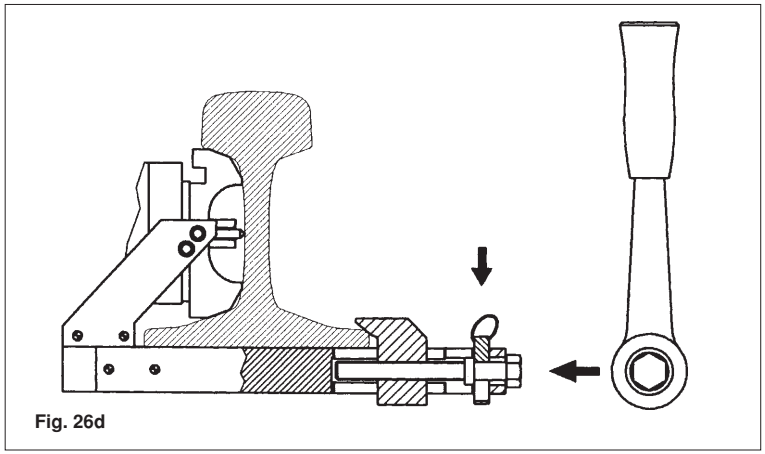


Fig. 26d

10.2.6) **To remove the drill from the rail** slacken screw (04) just enough to release the clevis (03); lift the clevis and slide the "rod (02) - screw (04)" assembly by hand into the fully open position, which enables the drill to be removed from the rail flange.

⚠ **N.B.:**
With a cutter/bit fitted and the drilling machine clamped to the rail,to avoid advance lever interference in train area make sure before commencing driling that:
• The spindle shaft is completely withdrawn and the advance lever is parallel with the axis of the rail, facing in the direction shown in Fig. 27.
• Check that the lever is not free to move (see § 5.1).

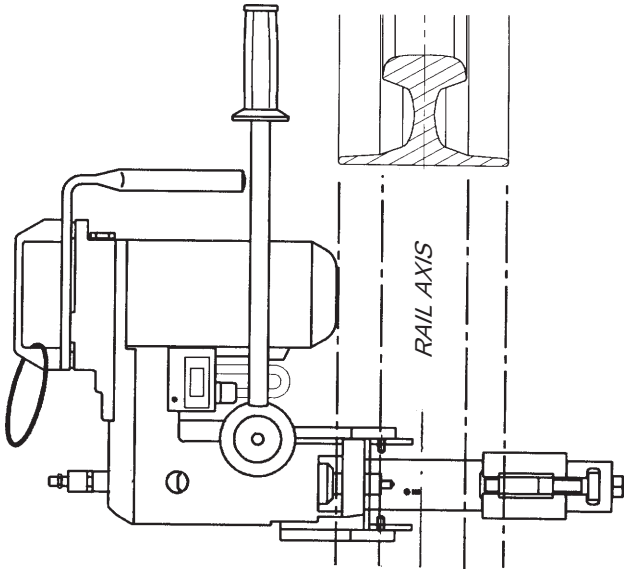


FIG. 27

WARNING
– Full battery capacity will be obtained after 4-5 full charge/discharge cycles.
– Always store battery pack in a dry place.
– Avoid laying the battery pack onto mud or dusty surfaces.
– Never leave the battery pack in rain, which may filter inside causing damage to circuits.
– Always put protection cap (91) back onto socket (94) after use.
– Never shunt inner contact pins of battery socket (94).
– Always use the charger supplied with the pack to re-charge the batteries.
– Do not discard batteries into garbage can or waste disposal.
– Batteries are sealed non-spillable. Lead acid battery must be recycled.

4.1) Charging the battery pack
The charger supplied with the drill is suitable for re-charging lead (Pb) batteries.

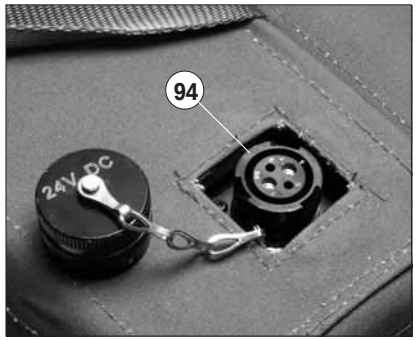
3 Step charger:

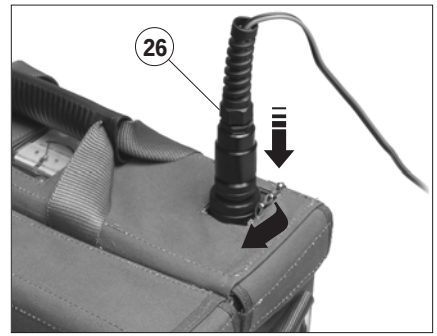
– *Orange led:* the battery is dischaged and the charging current is maximum.

– *Yellow led:* the battery is normally between 80 and 95% charged and the charging current is lower than maximum.

– *Green Led:* the battery is fully charged and the charger is in standby mode.

Connect the battery charger to electricity supply : 110 - 240 V AC.
To charge the battery pack, connect the charger plug (26) to the battery pack socket (94).
The charging time for the battery pack is approx. 2h +/-30 min.





⚠ ***The charger shall be used only indoor avoiding water or dust contact.***
To avoid overheating, never cover the charger during use.

5. SR 5000 COOLING UNIT (Refer to Fig. 3)

The type SR 5000 cooling unit consists of a tank complete with tube and maximum pressure valve (01), fitted with a pump device for pressurisation, which must be connected to the attachment (35) on the drill by means of its quick-coupling (03).
The delivery and shutoff of the lubrocoolant are controlled automatically, when drilling with a broach cutter, from the position of the guide bit; when drilling with spiral bit, the delivery and shutoff of the fluid must be effected manually by operating the tap (02). The use of the lubrocoolant supplied by **Cembre** in the recommended concentrations, guarantees optimum use of the drilling tools.
The consumption of the lubrocoolant depends both on the variable degree of opening of the tap (02) and the inner pressure of the tank: it is therefore advisable to open the tap a little when the tank is at maximum pressure, whilst it must be fully opened when the pressure in the tank is low.
When using the cooling system pay careful attention to the instructions on the tank label.

Warning:

- ***When the tank is not under pressure, check that the bush on the maximum pressure valve is screwed right down.***
- ***To fill tank with lubrocoolant, turn handle anticlockwise approximately 2 turns to release handle locking mechanism. Remove handle/piston assembly from tank.***

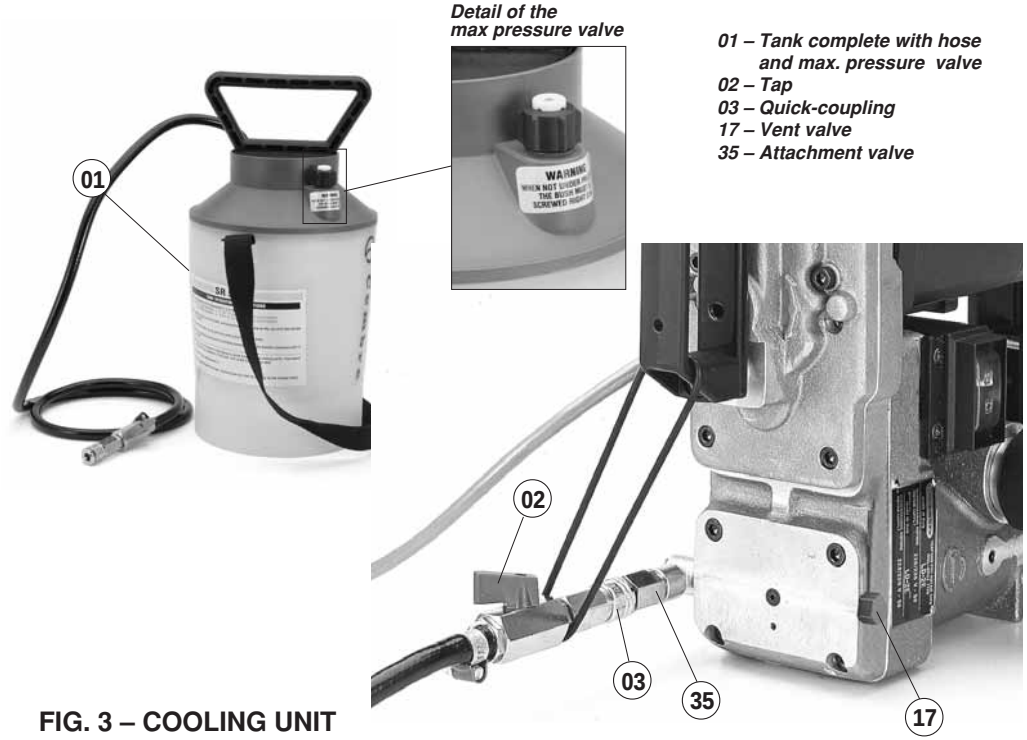


FIG. 3 – COOLING UNIT

10.2) Clamping to the rail flange (Refer to Fig. 26).
To clamp the drill complete with the DBS device (§ 9.1) to the rail, proceed as follows:
10.2.1) Remove clevis (03) from its housing, and slide the entire "bar (02) - screw (04)" assembly by hand into the "fully open" position.
10.2.2) Insert the drill, keeping it slightly inclined downwards, underneath the rail flange near the point to be drilled (Fig. 26a).

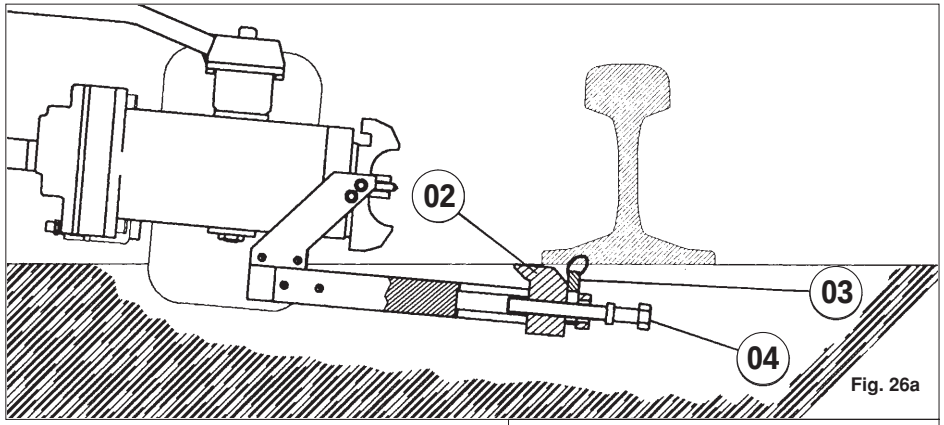


Fig. 26a

FIG. 26
CLAMPING TO THE RAIL FLANGE

10.2.3) With the positioning templates inserted between the head and flange of the rail, bring the drill into the horizontal position: the rail flange must be parallel with the base of the DBS clamping device (Fig. 26b).

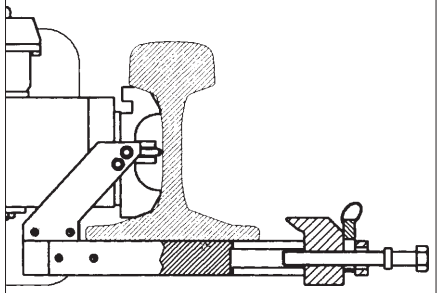


Fig. 26b

10.2.4) Slide the "rod-screw" assembly by hand into the "fully closed" position so that the bar (02) is supported on the edge of the rail flange (Fig. 26c).
If such a position is not achieved, use screw (04) for adjustment.

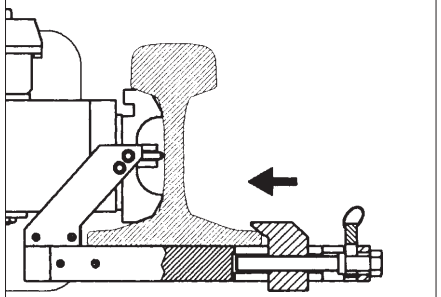


Fig. 26c

10.1) Fitting the DBS clamping device on the drill (Refer to Fig. 25).
To fit the DBS device on the drill proceed as follows:

10.1.1) Select the positioning template appropriate to the type of rail to be drilled.

10.1.2) Fit the positioning template on the DBS clamping device by securing it with the two special screws and related nuts supplied (see Fig. 22).
Bear in mind that the small square "windows" provided on the lateral wings of the template must face upwards; position the template approx. 90° to the base of the device, then screw up the two nuts without fully tightening them.
Ensure holes on the device, labelled 'A' and 'B', correspond with those on the template.

10.1.3) Withdraw the spindle completely.

10.1.4) Fit the "DBS + MPAF ..." assembly on the front plate of the drill; clamp the positioning template by **tightening** the appropriate screws fully.

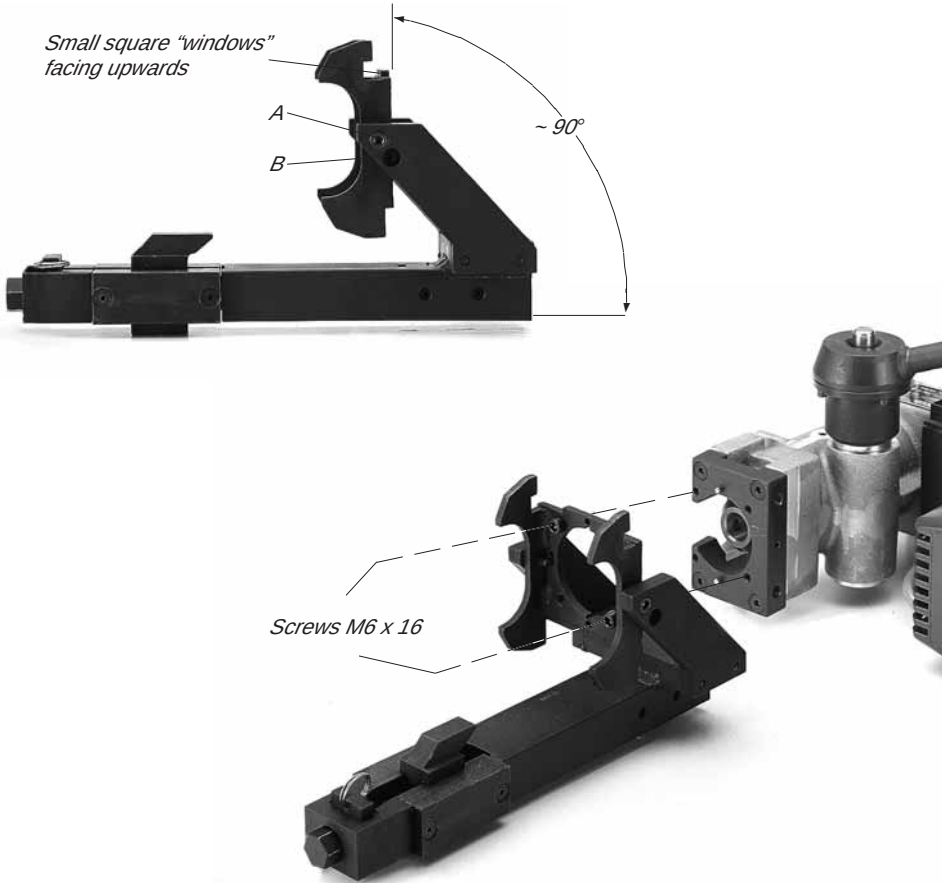


FIG. 25 – ASSEMBLY OF DBS CLAMPING DEVICE

- ***The rail drill is equipped with the cooling attachment valve (35) and a vent valve (17) which are located as shown (Fig. 3). If under certain operating circumstances they need to be interchanged, proceed as follows:***
  - *with a 17 mm hexagonal spanner unscrew the vent valve from its seating.*
  - *using the 4 mm Allen key provided with the drill, remove the appropriate cooling valve from its seat and fit into the vent valve seat.*
  - *Fit the vent valve into the removed coolant valve seating.*

- ***When temperatures fall below 32° F (0° C) the lubrocoolant may freeze which could cause damage to the seals contained in the drill cooling system. It is therefore advisable, when storing the drilling machine, to empty the lubrocoolant system completely. Proceed as follows (Fig. 4):***
  - *Disconnect the quick coupling (03) from the coolant attachment (35) on the drilling machine.*
  - *Tilt the machine so that the coolant attachment is at its lowest point - allowing for natural drainage.*
  - *Operate the advancing lever (36) to advance and retract the drilling spindle.*
  - *Gently shake the machine to establish expulsion of all fluid.*

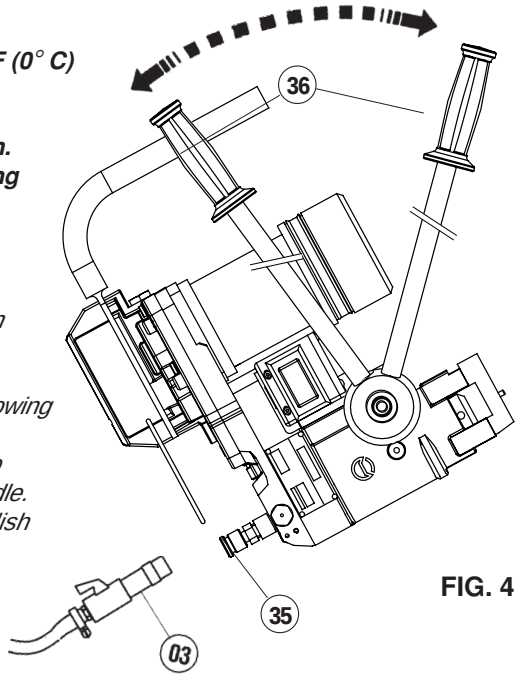


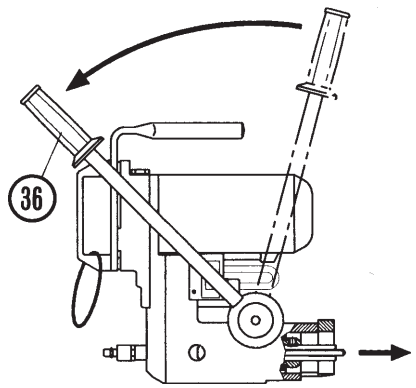
FIG. 4

5.1) ARE adapter
For use with type **SR 5000 cooling unit**. The **ARE** adapter is inserted in the quick-coupling of the tank tube (refer to Fig. 5), **it may be used to provide manual external cooling when cutters are used to enlarge existing holes, or when using spiral bits not designed for automatic cooling.**
If necessary the **ARE** adapter can also be used to clean various parts of the drill, by means of the lubrocoolant pressure jet, e.g. parts such as the tool clamping seat in the spindle shaft, seats for the shoe fixing screws, etc.

FIG. 5 – ARE ADAPTER

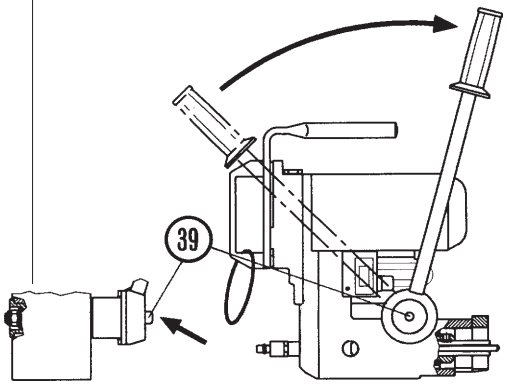
6. SPINDLE ADVANCE LEVER (Refer to Fig. 6)

The spindle is advanced by moving the lever (36) (See Fig. 6 a). The lever is fitted with a release pawl (39) which, when pressed, renders it independent of the hub and hence the spindle; the operator can therefore easily vary the angular position of the lever without movement of the spindle (Fig.6).

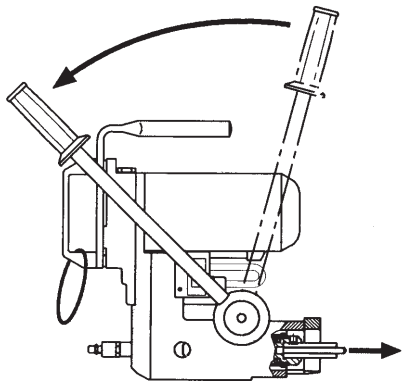


6a - Moving the lever (36) towards the operator produces a corresponding advance of the spindle.

FIG. 6



6b - With the release pawl (39) pressed, the lever is released from its hub and can repeat the previous travel without the spindle moving.

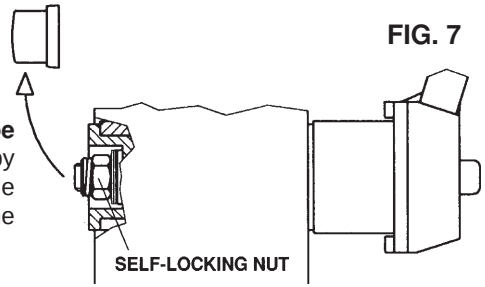


6c - With the hub released, moving the lever towards the operator produces a corresponding advance of this spindle.

6.1) Adjustment of the advance lever

The movement of the lever **must never be loose**, for adjustment proceed to tighten it by loading the cup springs by means of the associated self-locking nut, after removing the protective cap (see Fig. 7).

FIG. 7



The DBS Clamping Device is used by attaching to it one of the various rail type positioning templates available. (To be ordered separately).
e.g.:

MPAF UIC54
MPAF UIC60
MPAF...

FIG. 23 – POSITIONING TEMPLATES

The DBS Clamping device has been designed to **clamp the drill to the flange of the rail in "Non Possession" conditions. It can therefore remain in position even during the passage of trains over it.**
The drill is clamped between the assembled positioning template and the clamping bar (04) of the DBS device (see Fig. 24).

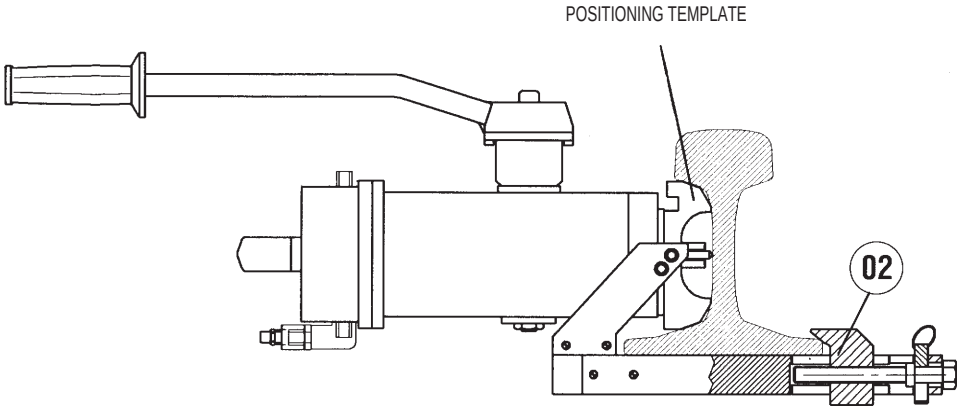


FIG. 24 – CLAMPING TO THE RAIL FLANGE

10. DRILL EQUIPPED WITH DBS DEVICE

For operator safety, the DBS device for clamping the drill to the flange rails must not clamped between the tracks but always outside them.

The DBS clamping device is suitable for clamping the drilling machine to the flange rails, for use in "Non Possession" conditions.
Using this device the rail drill can remain clamped in the drilling position even when trains pass over it (Refer to Fig. 22).

The **DBS** device consists of:
– clamping unit
– 2 pcs special M6 screws (09)
– 2 pcs self-lock nuts (10)

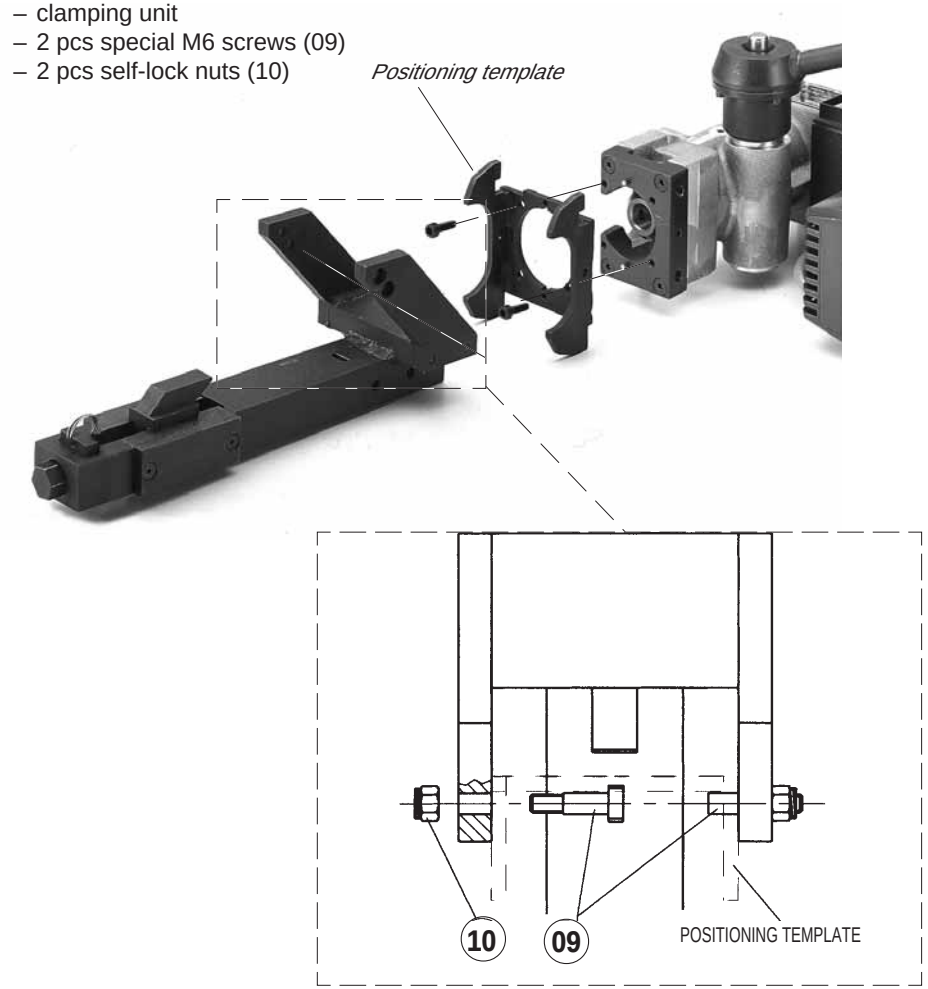


FIG. 22 – DBS CLAMPING DEVICE

7. PREPARING THE DRILL

7.1) Assembling broach cutters (Refer to Figs. 8-11).
7.1.1) Insert the guide bit in the cutter from the side of the spigot.
7.1.2) Using the lever (36), position the spindle shaft (07) so that both grub screws (18) become accessible and sufficient space is provided to insert the cutter; if necessary rotate the spindle shaft manually and sufficiently by inserting the 4 mm male hexagon key in the appropriate intermediate gear housing (33) in the crankcase of drill corresponding to the feed handle (05) (see Fig. 11).
7.1.3) Insert the cutter in the spindle shaft so that the two engaging dogs on the cutter spigot line up with the grub screws.
7.1.4) Clamp the cutter by fully tightening the grub screws using of the 4 mm male hexagon key.
7.1.5) Check that the guide bit slides freely by applying slight pressure on it.

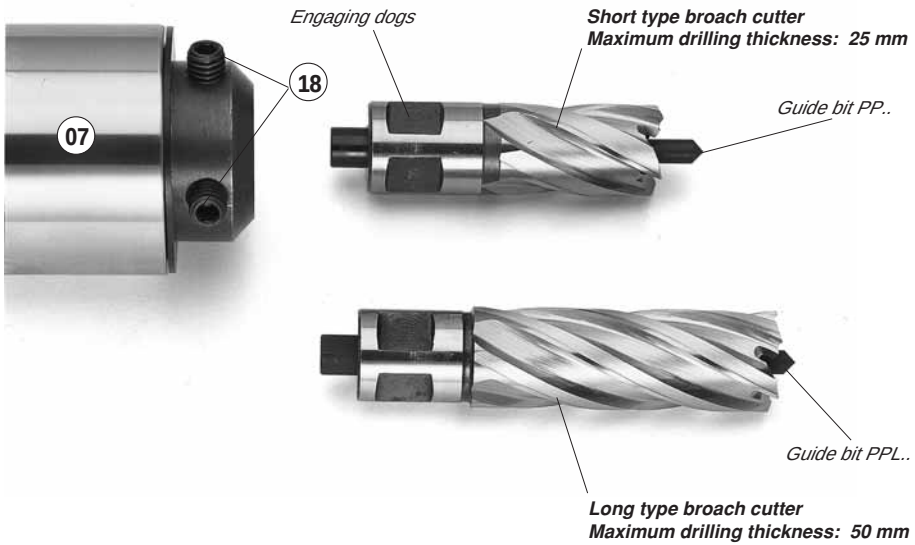


FIG. 8 – ASSEMBLING BROACH CUTTERS

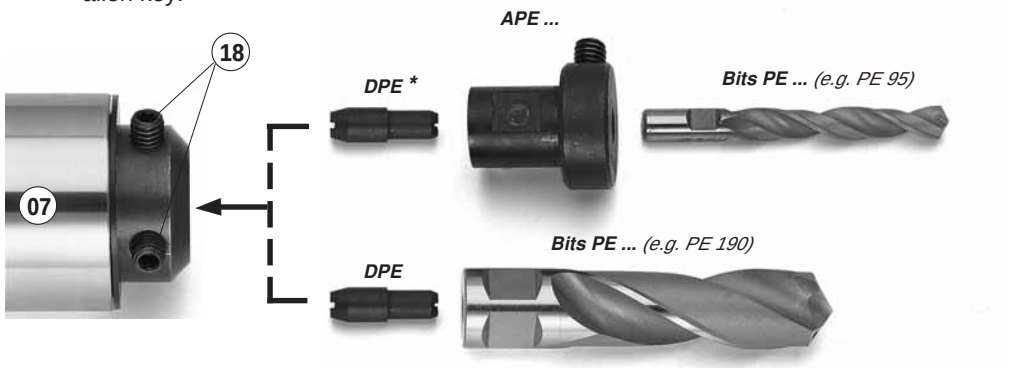
7.2) Assembling spiral bits (Refer to Figs. 9 - 11)

7.2.1) Using the advance lever, position the spindle shaft so that both grub screws become accessible and sufficient space is provided to insert the spiral bit; if necessary rotate the spindle shaft manually and sufficiently by inserting the 4 mm male hexagon key in the appropriate intermediate gear housing in the crankcase of the drill corresponding to the back handle (see Fig. 11).

7.2.2) Insert into the spindle shaft the **DPE** spacer required to activate the cooling device. If necessary to use **APE...** adapter (see pag.8) the bit must first be fitted in the corresponding **APE** adapter and locked with the appropriate grub screw and then the **DPE** spacer inserted.
Note: Adapters type APED… do not require use of DPE spacer.

7.2.3) Insert the bit-spacer unit in the spindle shaft so that the two engaging dogs on the bit spigot line up with the grub screws. **Press the bit-spacer unit home against the inner seat of the spindle: this will enable the DPE spacer to open the cooling circuit** (see Fig. 10).

7.2.4) Clamp the bit by fully tightening the two grub screws (18) using the 4 mm male allen key.



** use only for APE..., not required for APED...*

FIG. 9 – ASSEMBLING THE SPIRAL BITS

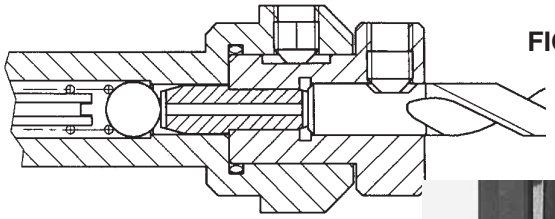


FIG.10 – ASSEMBLING THE BIT-SPACER UNIT

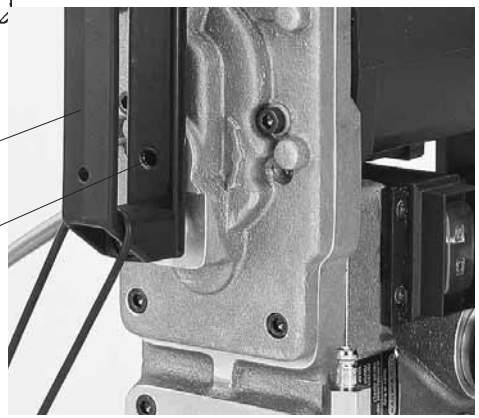


FIG. 11 – MANUAL SPINDLE ROTATION

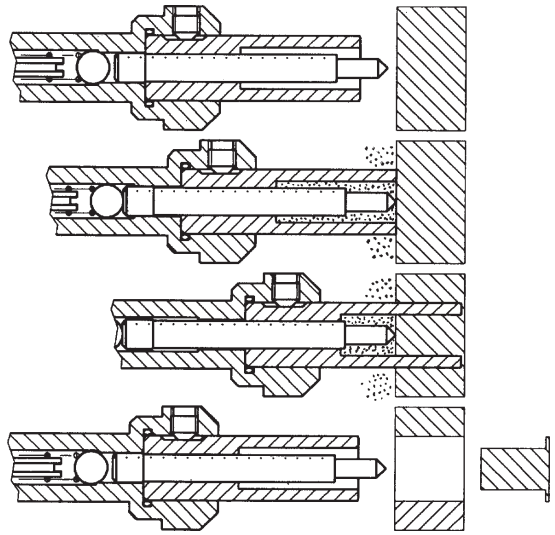


FIG. 20 – COOLANT OPERATION WITH BROACH CUTTER

9.3) Drill fitted with special spiral bit

Follow the sequence described in § 9.1, taking care to position the drill on the rail by keeping the **spindle fully withdrawn**. Bear in mind that the cooling circuit, instead of being automatically opened and closed by the guide bit, is kept open at all times by the **DPE** spacer fitted on the spigot of the spiral bit; it must therefore be activated, by opening the tap (02), before starting to drill, then switched off after drilling by closing the tap.

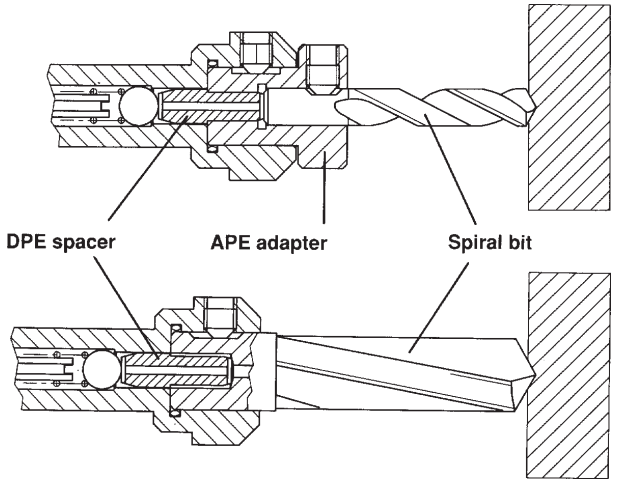


FIG. 21 – COOLANT OPERATION WITH SPIRAL BIT

9.1.6) Proceed to drill by initially applying light pressure on the lever (36), increasing the pressure progressively, avoiding jolts, and finally relieving the pressure in the exit phase. When drilling close to raised markings on the rail the initial pressure must be extremely light until the markings disappear, otherwise the cutter may be damaged.

9.1.7) The guide bit will enable the lubrocoolant to be discharged throughout the drilling process.

9.1.8) When drilling has been completed, fully retract the spindle, **stop the motor by pressing the automatic switch (position " 0 ")** , and make sure that drilling swarf is removed before recommencing drilling.

9.1.9) After drilling it is advisable to remove all swarf from the tool and spindle area.

9.2) Drill fitted with "long" type broach cutter (for drilling thicknesses of up to **2"**). Follow the sequence described in § 9.1, taking care to position the drill on the rail by keeping **the spindle fully withdrawn.**

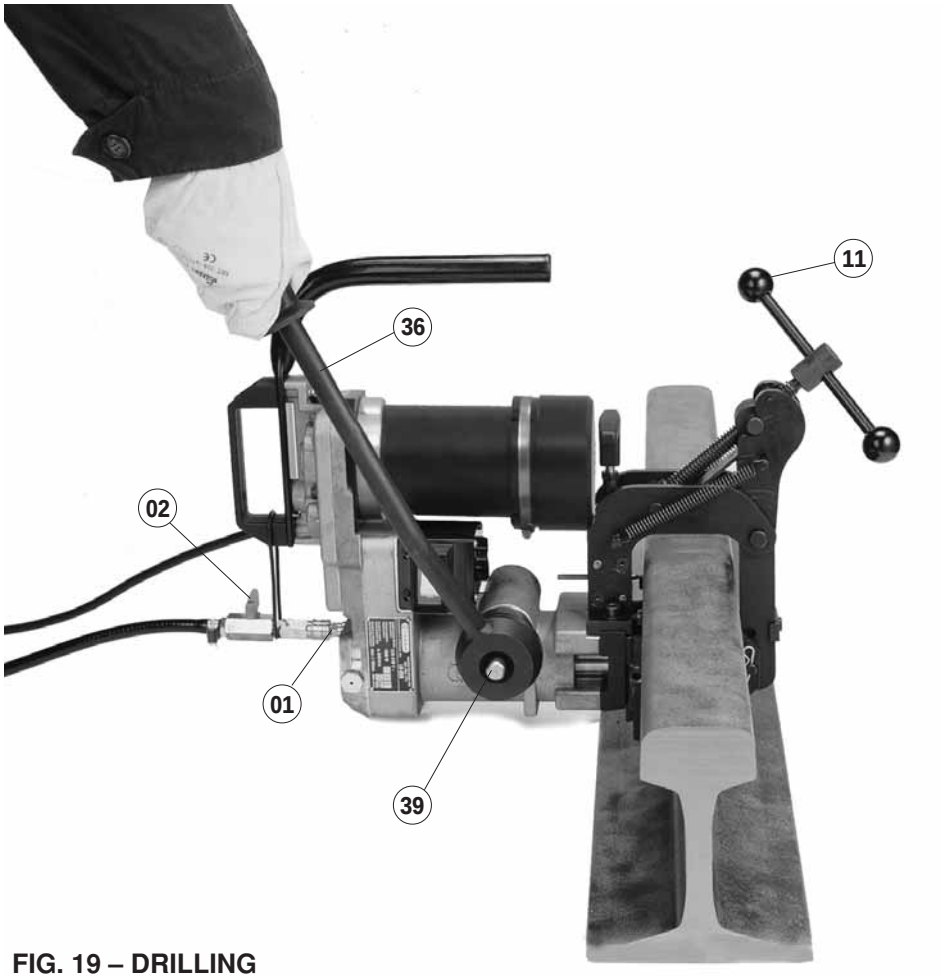


FIG. 19 – DRILLING

8. DRILL TYPE LD-12B

The reference **LD-12B** relates to the entire LD-12BN drill complete with the clamping device DBG-F for clamping it to the rail web and fittings.

The clamping devices consists of:
– clamping unit
– termination
– socket head cap screws **M8 x 25** (2 pcs)
– spring washers (4 pcs)
– reference rod

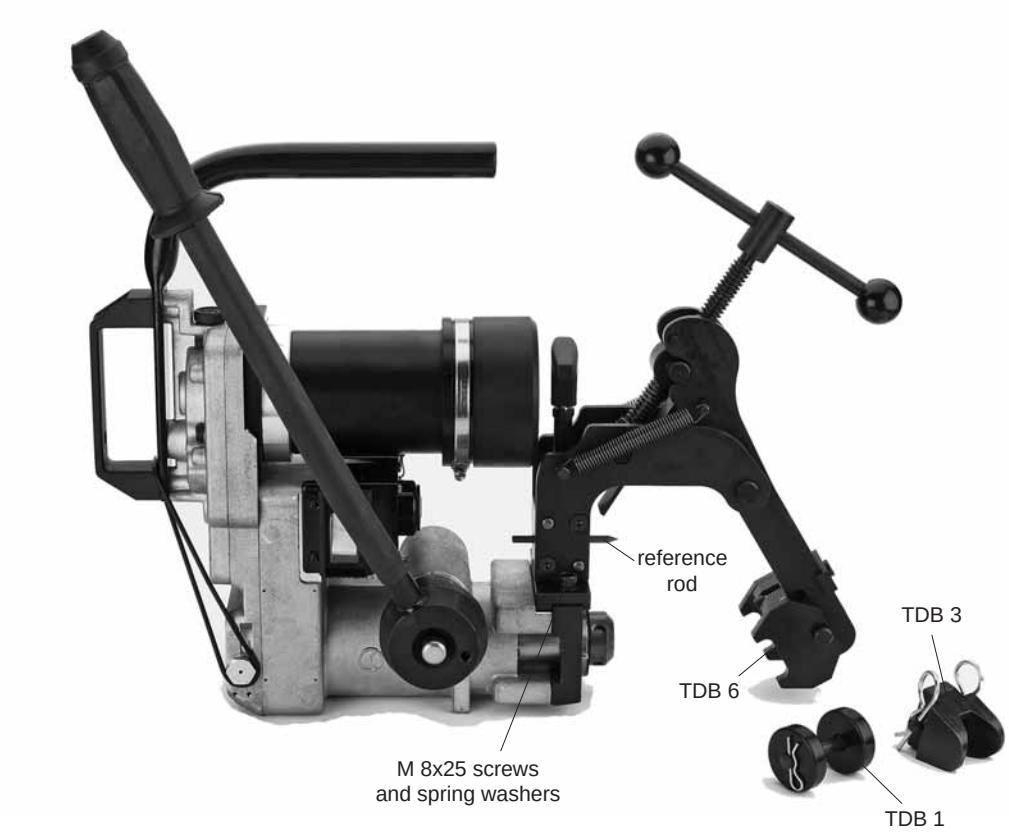


FIG. 12 – DRILL TYPE LD-12B

8.1) Assembling end pieces.

TDB 1, TDB 6 and **TDB 3** end pieces of the **DBG-F** device, with moving arm, have been designed for adaptation to the different operating conditions on rails and fittings; their assembly is shown in Fig. 13.

- ***When assembling the TDB 3 end piece ensure that the positioning pawl is pointing downward in relation to the bolt.***
- ***When disassembling the TDB 6 end piece ensure that, after removing the pivot, the complete assembly is slid away downwards without acting on the holding plate.***
- ***Over-advancing the spindle after drilling must be avoided when using the TDB 1 and TDB 3 end pieces.***

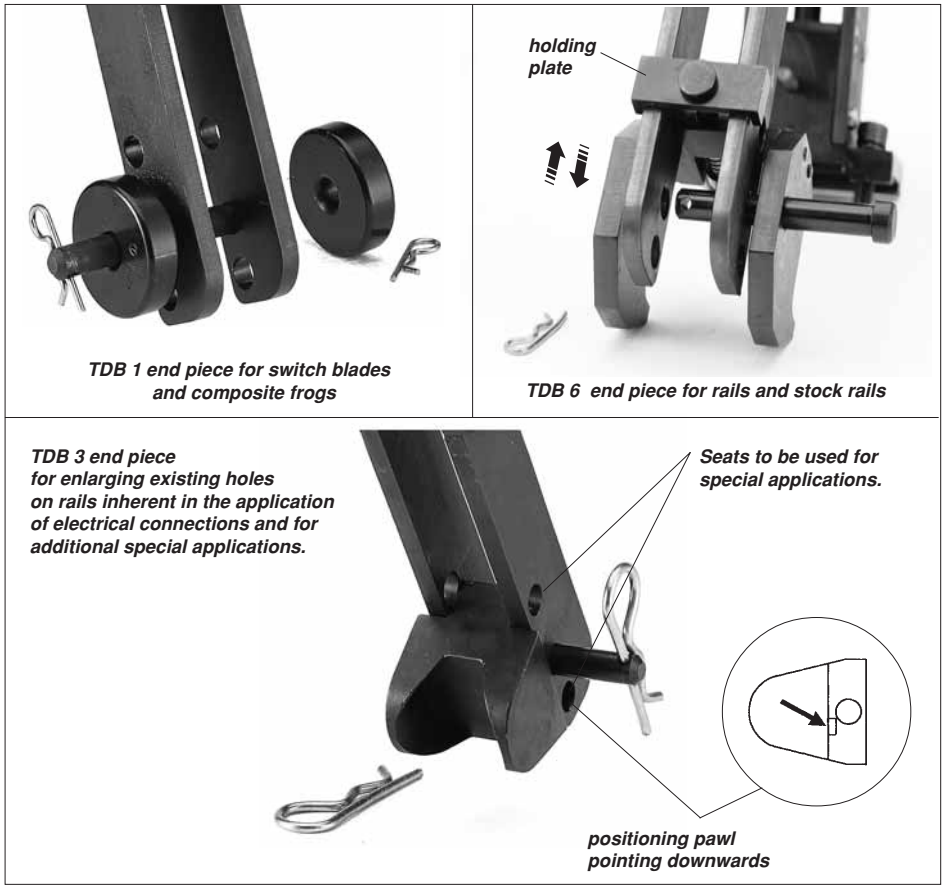

holding plate
TDB 1 end piece for switch blades and composite frogs
TDB 6 end piece for rails and stock rails
TDB 3 end piece for enlarging existing holes on rails inherent in the application of electrical connections and for additional special applications.
Seats to be used for special applications.
positioning pawl pointing downwards

FIG.13 – ASSEMBLY END PIECES

9.1.4) Before starting any work, press the test push-button (90) (Fig. 17d) to check the battery condition (see **§ 4**). **Make sure drill switch (04) is in position "0"** (Fig. 18)**.**
Connect feed cord to drill plug and turn lock bush until the "click" (Fig. 17e). Follow the same route to connect battery pack (Fig. 17f).

FIG. 17d

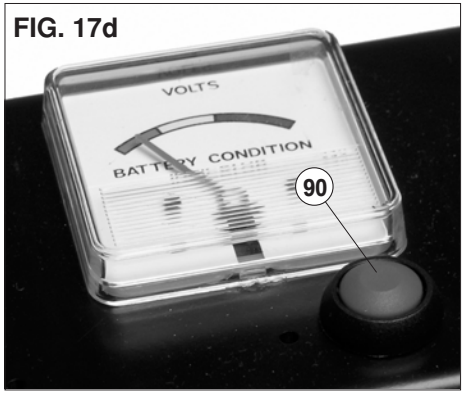


FIG. 17e

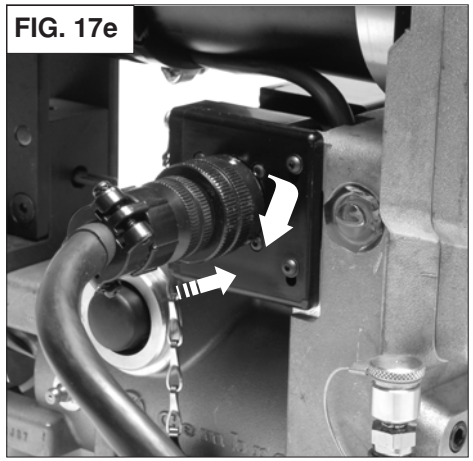


FIG. 17f

9.1.5) Press automatic switch (04) in position " **I** " (Fig. 18) to start the motor.

⚠ **CAUTION: the automatic switch is equipped with protection against motor overheating; should the motor overheat the relay cut-out setting, the switch will move into the "0" position. At this stage, if the thermal conditions are correct, the switch will have to be re-set manually.**

FIG. 18

9. DRILLING (Refer to Figs. 17-19)

⚠ **N.B.: switch on the cooling system before starting the drill (§ 5).**

9.1) Drill fitted with "short" type broach cutter (for drilling thicknesses of up to **1"**).
The drilling sequence may be started with the drill fitted with the broach cutter (§ 7.1), clamping end piece (§ 8.1), positioning template (§ 8.3), the drill being clamped to the rail (§ 8.4), as follows:

9.1.1) Connect the female quick-coupling of the **SR 5000 coolant unit to the male coupling** (01) on the drill (Fig. 19).

9.1.2) Open the tap (02) fitted on the coolant unit hose.

9.1.3) Using the lever (36) bring the guide bit almost in contact with the rail (Fig. 17a); keeping the release pawl (39) pressed, release the lever from its cup and return it to the initial position (Fig. 17b), which will enable the travel of the lever (36) to be used in the most advantageous way.

Fig. 17a

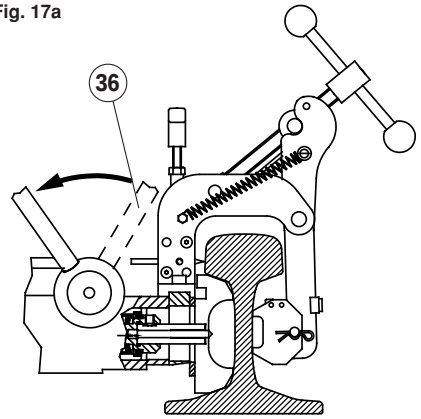


Fig. 17b

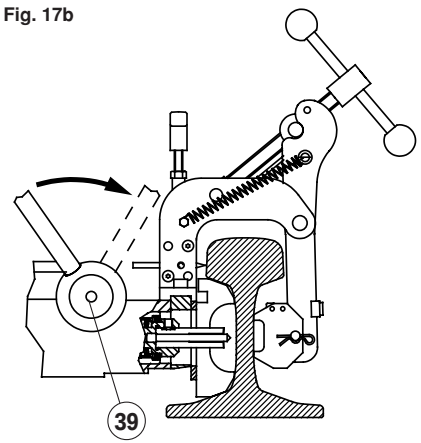
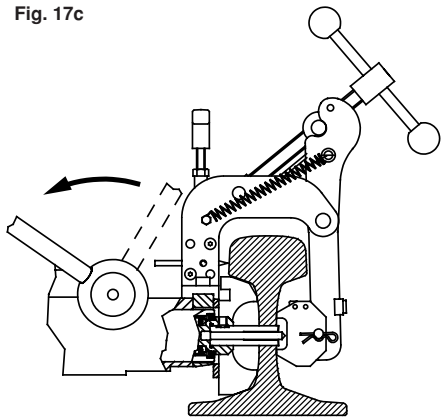


Fig. 17c



8.2) Assembly of the clamping device on the drill
The clamping device is fitted to the front plate of the drill, centred by means of the reference pin supplied and secured with the two screws **M 8x25** (35) also supplied.
The assembly is illustrated in Fig. 14.

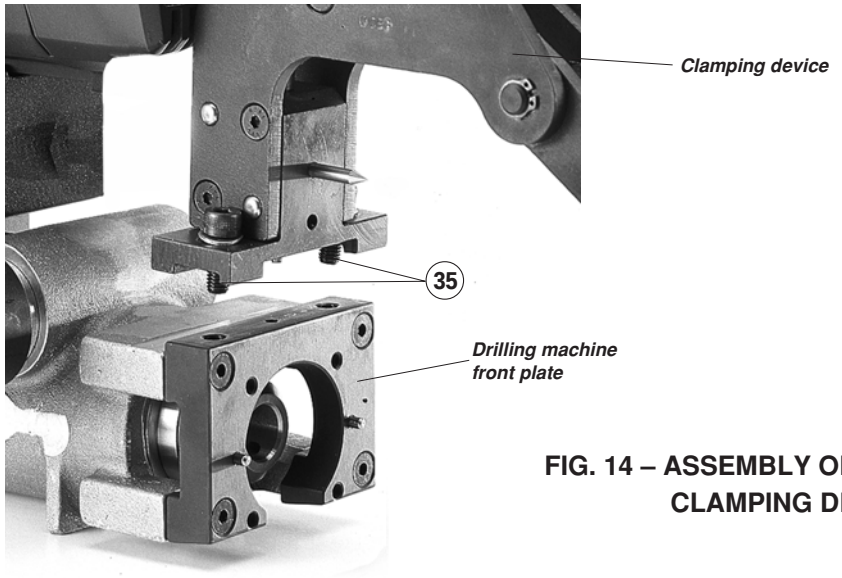


FIG. 14 – ASSEMBLY OF THE CLAMPING DEVICE

8.3) Assembly of the positioning templates
(Refer to Fig. 15)
The type **MPAF** .. and **MPAU** positioning templates are secured to the front plate (04) of the drill by means of the two socket head cap screws **M 6x16** supplied.

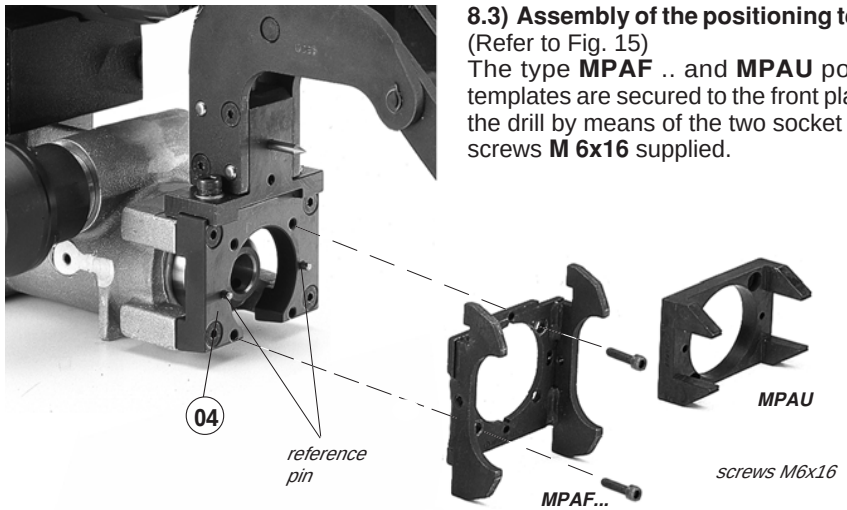
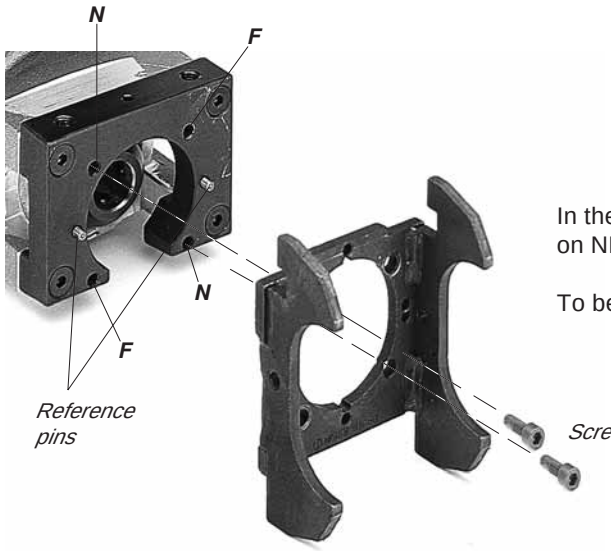


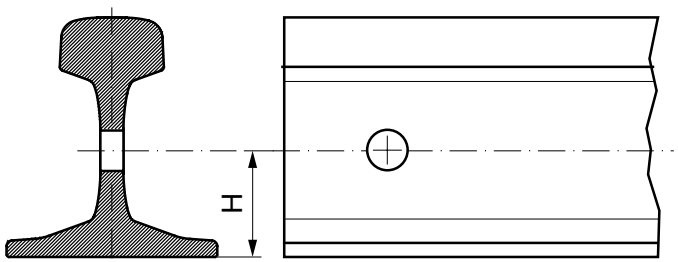
FIG. 15 – ASSEMBLY OF THE POSITIONING TEMPLATES

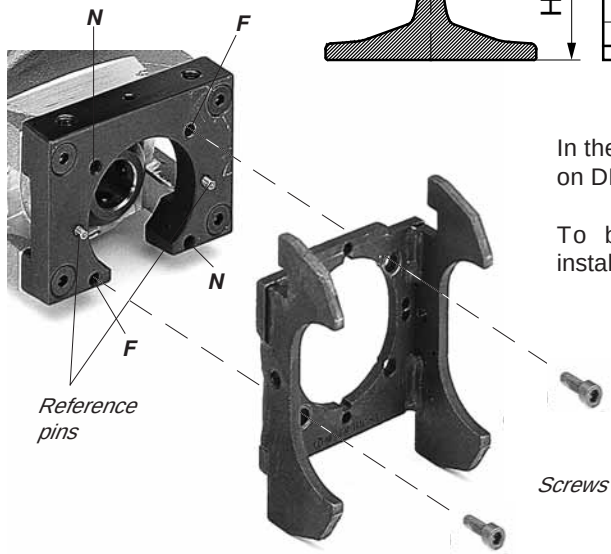
8.3.1) Assembling the MPAFN UIC60 positioning template (refer to Fig. 15a)



In the **"N"** position to obtain drilling on NEUTRAL AXIS, H= 80,95 mm.

To be used for drilling UIC60 rail.





In the **"F"** position to obtain drilling on DRILLING AXIS, H= 76,3 mm.

To be used according to the installation instructions.

FIG. 15a – ASSEMBLING MPAFN UIC60 POSITIONING TEMPLATE

8.4) Clamping to the rail web (Refer to Fig. 16)

The drill has a rapid rail engagement/release mechanism and specially shaped positioning templates for each rail type which facilitate precise and certain location of the part to be drilled.

To fully exploit the special features of the engagement device, we recommend calibrating it to the rail type to be drilled as follows:

8.4.1) Withdraw the spindle shaft (07) completely by means of the lever (36).

8.4.2) Insert the threaded bush (39) of screw (11) into its seat (A) in the mobile arm (17) (see detail in Fig. 16); use the hand-wheel (12) to completely open the mobile arm.

8.4.3) Place the drill on the rail at the point to be drilled and **clamp it by tightening the hand-wheel fully down (12)**: the positioning template will automatically position the cutter or drill bit in line with the designated axis; if precise positioning is necessary to the longitudinal track axis, use the reference pin (01).

8.4.4) For rapid drill release, simply back-off the hand-wheel (12) by approximately two complete turns, and while supporting the drill by its grip (09), pull the hand-wheel towards you. The threaded bush (39) will disengage the seat (A) in the mobile arm (17) which will open automatically, freeing the drill.

In this way, the operator can rapidly remove the machine from the rail in case of danger, or move on to drill another hole.

Thus, the next rail engagement operation will be considerably simplified:

after positioning the drill at the point to be drilled, simply push the hand-wheel forwards so that the threaded bush engages the seat (A) of the mobile arm. Now, a few turns on the hand-wheel will be sufficient to engage the drill correctly on the rail.

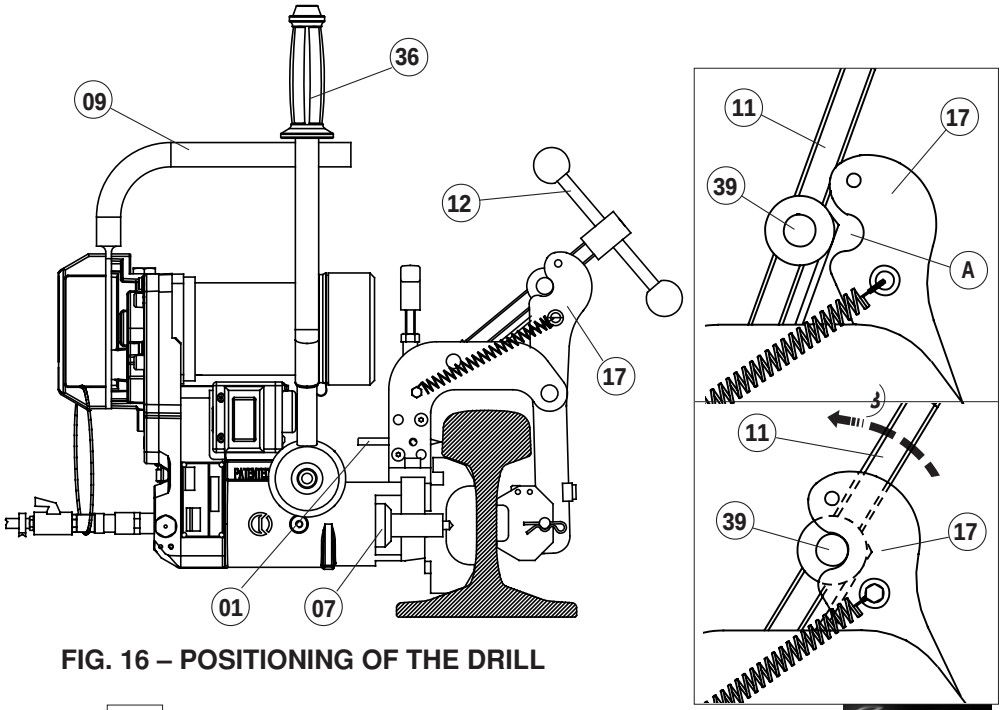


FIG. 16 – POSITIONING OF THE DRILL